

Illuminating innovation: the innovation lessons in depth

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Why this case is worth studying

Edison matters less for any single device than for showing that innovation can be organised. His story holds most of the recurring problems of the field: the myth of the lone genius, the gap between invention and value, competing inventors racing for the same prize, and the hard question of when persistence becomes stubbornness. The ten lessons in the episode are grouped here into six themes, each linked to a body of research.

1. Nobody invents alone (episode lessons 1 and 3)

The idea. Innovation is a collective achievement that draws on networks and varied knowledge. Hargadon (2003) calls Menlo Park a "technology broker", linking ideas across fields. Page (2007) argues that diverse teams often outperform able but similar ones on complex problems.

In the case. The "muckers" were picked for their differences: Batchelor, an English machinist; Kruesi, a Swiss clockmaker; Boehm, a German glassblower; Upton, a Princeton mathematician. Boehm, not an electrical engineer, solved the vacuum seal. Upton's mathematics shaped the filament search. Western Union, then J.P. Morgan and the Vanderbilts, supplied the money. The photographs still show one man.

Contrast cases. The transistor at Bell Labs (1947) came from a mixed team of theorists and experimentalists. Tesla, working largely alone after he left Edison, struggled to turn brilliant ideas into lasting businesses.

For discussion. If innovation is collective, why do we keep crediting individuals? Who gains, and who is forgotten, when we do?

2. Innovation as a managed process (episode lessons 2 and 10)

The idea. Firms innovate repeatedly by building routines: learned, shared ways of doing things (Nelson and Winter 1982). Absorptive capacity, the ability to recognise and use new knowledge, grows from prior investment in learning (Cohen and Levinthal 1990).

In the case. Menlo Park was built in 1876 to make invention repeatable, with a target list and a promise of a minor invention every ten days. The team filled around 3,500 notebooks. They recorded the "Edison effect" though they had no use for it. Fleming, who knew Edison's London company, later built on it for the thermionic valve.

Contrast cases. Toyota's production system shows routines of continuous improvement on the factory floor. Xerox PARC shows the limit: superb research routines, weak routines for turning results into products.

For discussion. Can a process for creativity become a cage? What would Edison's notebooks look like inside a firm today, and who would keep them?

3. Learning by making, within limits (episode lessons 5 and 6)

The idea. Fast, cheap experiments cut the cost of learning (Thomke 2003; Schrage 2000), an idea later popularised as the minimum viable product (Ries 2011). Research on constraints suggests moderate limits can focus creative effort rather than stifle it (Acar, Tarakci and van Knippenberg 2019).

In the case. Kruesi built the first phonograph for \$18. Edison measured a bulb's volume by filling it with water while Upton was still calculating. The constraint was commercial: electric light had to beat gas on price. Copper costs turned that into a design brief for a high-resistance filament on low current.

Contrast cases. The Wright brothers' home-made wind tunnel gave them data the better-funded Langley lacked. Frugal or "jugaad" innovation in India turns scarcity into a design rule.

For discussion. Upton's calculation was what set the filament brief. When does thinking on paper beat building, and how would a team know which it needs?

4. Recombination and the crowded race (episode lesson 7, plus an added lesson)

The idea. New technologies are mostly new combinations of existing ones (Schumpeter; Arthur 2009). When the pieces are in place, several people tend to reach the same idea at once: "multiple discovery" (Ogburn and Thomas 1922; Merton 1961).

In the case. The phonograph joined telegraph paper-recording to the telephone's vibrating diaphragm. It then pointed Edison towards motion pictures. The lightbulb was a crowded race. Swan in England and Woodward and Evans in Canada were already working on it, and Edison bought the Canadian patent.

Contrast cases. Bell and Elisha Gray filed telephone papers on the same day in 1876. In Britain, Edison and Swan ended their rivalry by merging into the Ediswan company in 1883.

For discussion. If the lightbulb was bound to arrive, what did Edison actually add? Should patent systems reward the first to file, or the first to make something work at scale?

5. Invention is not enough (episode lesson 8)

The idea. Schumpeter separated invention, a new idea, from innovation, its commercial use. Teece (1986) showed that who profits often depends on complementary assets: production, distribution and supporting systems. Hughes (1983) described Edison as a system builder.

In the case. The 1869 vote recorder worked, but legislators did not want it. Edison drew the lesson that sale is proof of utility. For lighting he built the whole system: dynamos, wiring, meters, switches, fuses and networks. Pearl Street began supplying 85 customers and around 400 lamps on 4 September 1882.

Contrast cases. Xerox PARC built the graphical interface but Apple and Microsoft brought it to market. Better Place tried to build a whole battery-swapping system for electric cars and failed in 2013.

For discussion. Is building the whole system a strength or a trap for a newcomer? Which complementary assets would a start-up need to own today, and which could it borrow?

6. Persistence, pivots and knowing when to stop (episode lessons 4 and 9, plus an added lesson)

The idea. Persistence has a dark twin: escalation of commitment, pouring more into a failing course because of what is already spent (Staw 1976). Effectuation suggests limiting bets to an affordable loss and reusing what you have (Sarasvathy 2001). In standards battles, one dominant design usually wins (Abernathy and Utterback 1978; David and Bunn 1988).

In the case. The filament search took over a year and thousands of trials. After the 1914 West Orange fire, Edison planned to rebuild at once. When Minnesota ore made his ore-separation venture unviable, he reused the machinery for cement. Yet he fought a long, losing war of the currents against alternating current. Tesla, who briefly worked for him, left feeling cheated.

Contrast cases. Concorde is the classic escalation story. Slack began as the internal tool of a failing games company, a pivot from spare assets.

For discussion. Why could Edison pivot on ore but not on current? Who in an organisation should have the power to say stop?

Using this case in class

1. **Debate.** "This house believes Edison's greatest invention was the invention factory, not the lightbulb." Ask each side to use at least two named concepts from these notes.
2. **Strategy exercise.** Using Teece's complementary assets, map everything Pearl Street needed beyond the bulb. Then do the same for a current system innovation, such as electric-vehicle charging or home batteries. Which assets would a newcomer need to own?
3. **Personal reflection.** Recall a time you kept going on a project too long, or stopped too soon. What told you which it was? Write a short note in the style of an Edison notebook entry: what you tried, what you learned, what you would revisit.

Related episodes and cases

Case examples of other influential innovators - and the innovation lessons they offer

[James Brindley](#)

[Isaac Singer](#)

[Walter Hunt](#)

[Josiah Wedgwood](#)

Further reading

The story

- Israel, P. (1998) *Edison: A Life of Invention*. Wiley.
- Morris, E. (2019) *Edison*. Random House.
- Millard, A. (1990) *Edison and the Business of Innovation*. Johns Hopkins University Press.
- Jonnes, J. (2003) *Empires of Light*. Random House. On the war of the currents.
- An excellent book which touches on Edison's role in paving the way for the electronics industry of today is *Visionaries, rebels and machines* by Jamie Dobson. [His substack has some great video and text resources](#)

Primary source

- [The Thomas A. Edison Papers](#), Rutgers University: digitised notebooks, letters and patents, free to search.

Key academic references

- Abernathy, W. and Utterback, J. (1978) Patterns of industrial innovation. *Technology Review*.
- Acar, O., Tarakci, M. and van Knippenberg, D. (2019) Creativity and innovation under constraints. *Journal of Management*.
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- Ogburn, W. and Thomas, D. (1922) Are inventions inevitable? *Political Science Quarterly*.
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Episode source: [Illuminating innovation – beyond the light-bulb moment](#), Managing Innovation, 5 October 2026.